



## **DEPARTMENT OF THE INTERIOR**

### **Fish and Wildlife Service**

#### **50 CFR Part 17**

**[Docket No. FWS–R4–ES–2017–0061; 4500030113]**

**RIN 1018–BC14**

### **Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Panama City Crayfish**

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Proposed rule.

**SUMMARY:** We, the U.S. Fish and Wildlife Service (Service), announce a 12-month finding on a petition to list the Panama City crayfish (*Procambarus econfinae*), a semi-terrestrial crayfish species native to Bay County, Florida, as a threatened species under the Endangered Species Act (Act). After review of the best available scientific and commercial information, we find that listing this species is warranted. Accordingly, we propose to list the Panama City crayfish as a threatened species under the Act. If we finalize this rule as proposed, it would extend the Act's protections to this species and add this species to the Federal List of Endangered and Threatened Wildlife (List).

**DATES:** We will accept comments received or postmarked on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

Comments submitted electronically using the Federal eRulemaking Portal (see

**ADDRESSES**, below) must be received by 11:59 p.m. Eastern Time on the closing date.

We must receive requests for public hearings, in writing, at the address shown in **FOR FURTHER INFORMATION CONTACT** by [INSERT DATE 45 DAYS AFTER

DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** *Document availability:* The report upon which this proposed rule is based (see **SUPPLEMENTARY INFORMATION**) is available at <http://www.regulations.gov> in Docket No. FWS–R4–ES–2017–0061 and on the Service’s Southeast Region website at <https://www.fws.gov/southeast/>.

*Comment submission:* You may submit comments by one of the following methods:

(1) *Electronically:* Go to the Federal eRulemaking Portal:

<http://www.regulations.gov>. In the Search box, enter FWS–R4–ES–2017–0061, which is the docket number for this rulemaking. Then, in the Search panel on the left side of the screen, under the Document Type heading, click on the Proposed Rules link to locate this document. You may submit a comment by clicking on “Comment Now!”

(2) *By hard copy:* Submit by U.S. mail or hand-delivery to: Public Comments Processing, Attn: FWS–R4–ES–2017–0061; U.S. Fish and Wildlife Service, MS: BPHC, 5275 Leesburg Pike, Falls Church, VA 22041–3803.

We request that you send comments only by the methods described above. We will post all comments on <http://www.regulations.gov>. This generally means that we will post any personal information you provide us (see *Public Comments*, below, for more information).

**FOR FURTHER INFORMATION CONTACT:** Catherine Phillips, Field Supervisor, U.S. Fish and Wildlife Service, Panama City Ecological Services Field Office, 1601 Balboa Avenue, Panama City, FL 32405; telephone 850–769–0552; facsimile 850–763–2177. Persons who use a telecommunications device for the deaf (TDD) may call the

Federal Relay Service at 800–877–8339.

## **SUPPLEMENTARY INFORMATION:**

### **Executive Summary**

*Why we need to publish a rule.* Under the Act, if we determine that a species is an endangered or threatened species throughout all or a significant portion of its range, we are required to promptly publish a proposal in the *Federal Register* and make a determination on our proposal within 1 year. Critical habitat shall be designated, to the maximum extent prudent and determinable, for any species determined to be an endangered or threatened species under the Act. Listing a species as an endangered or threatened species and designations and revisions of critical habitat can be completed only by issuing a rule.

This rule proposes adding the Panama City crayfish (*Procambarus econfinae*) as a threatened species to the List of Endangered and Threatened Wildlife in title 50 of the Code of Federal Regulations (50 CFR 17.11(h)).

*The basis for our action.* Under the Act, we may determine that a species is an endangered or threatened species based on any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) Overutilization for commercial, recreational, scientific, or educational purposes; (C) Disease or predation; (D) The inadequacy of existing regulatory mechanisms; or (E) Other natural or manmade factors affecting its continued existence. We have determined that habitat loss and fragmentation from development (Factor A) is the primary threat to the Panama City crayfish.

## **Supporting Documents**

A species status assessment (SSA) team prepared an SSA report for the Panama City crayfish. The SSA team was composed of Service biologists, in consultation with other species experts. The SSA report represents a compilation of the best scientific and commercial data available concerning the status of the species, including the impacts of past, present, and future factors (both negative and beneficial) affecting the species. Maps depicting the historical range and current populations are included in the SSA for reference.

*Peer review.* We solicited independent peer review of the SSA Report by six individuals with expertise in crayfish; aquatic invertebrates, population, or landscape ecology; genetics and conservation genetics; and/or speciation and conservation biology. We received comments from one of the six peer reviewers. The SSA report and other materials relating to this proposal can be found on the Service's Southeast Region website at <https://www.fws.gov/southeast/> and at <http://www.regulations.gov> under Docket No. FWS-R4-ES-2017-0061.

## **Information Requested**

### *Public Comments*

We intend that any final action resulting from this proposed rule will be based on the best scientific and commercial data available and be as accurate and as effective as possible. Therefore, we request comments or information from other concerned governmental agencies, Native American tribes, the scientific community, industry, or any other interested parties concerning this proposed rule. We particularly seek comments concerning:

- (1) The Panama City crayfish's biology, range, and population trends, including:
  - (a) Biological or ecological requirements of the species, including habitat requirements for feeding, breeding, and sheltering;
  - (b) Genetics and taxonomy;
  - (c) Historical and current range, including distribution patterns;
  - (d) Historical and current population levels, and current and projected trends; and
  - (e) Past and ongoing conservation measures for the species, its habitat, or both.
- (2) Factors that may affect the continued existence of the species, which may include habitat modification or destruction, overutilization, disease, predation, the inadequacy of existing regulatory mechanisms, or other natural or manmade factors.
- (3) Biological, commercial trade, or other relevant data concerning any threats (or lack thereof) to this species and existing regulations that may be addressing those threats.
- (4) Additional information concerning the historical and current status, range, distribution, and population size of this species, including the locations of any additional populations of this species.
- (5) Specific prohibitions and exceptions to those prohibitions that may be necessary and advisable for the Panama City crayfish's conservation. We intend to publish, as appropriate, a more tailored proposed rule with provisions set forth under section 4(d) of the Act for public review and comment in the future. Activities we are considering for potential exemption under a section 4(d) rule include, but are not necessarily limited to, exceptions for:

(a) Specific soil and vegetation restoration activities that will benefit the Panama City crayfish;

(b) Water quality improvement;

(c) Genetic and population monitoring;

(e) Activities that maintain native vegetation near occupied or likely to be occupied Panama City crayfish habitat;

(f) Sustainable silviculture practices that primarily occur adjacent to Panama City crayfish habitat and that are implemented according to certified best management practices; or

(g) Any additional activities that should fall under the 4(d) rule.

Please include sufficient information with your submission (such as scientific journal articles or other publications) to allow us to verify any scientific or commercial information you include.

Please note that submissions merely stating support for or opposition to the action under consideration without providing supporting information, although noted, will not be considered in making a determination, as section 4(b)(1)(A) of the Act directs that determinations as to whether any species is an endangered or threatened species must be made “solely on the basis of the best scientific and commercial data available.”

You may submit your comments and materials concerning this proposed rule by one of the methods listed in **ADDRESSES**. We request that you send comments only by the methods described in **ADDRESSES**.

If you submit information via *<http://www.regulations.gov>*, your entire submission—including any personal identifying information—will be posted on the

website. If your submission is made via a hardcopy that includes personal identifying information, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so. We will post all hardcopy submissions on <http://www.regulations.gov>.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on <http://www.regulations.gov>, or by appointment, during normal business hours, at the U.S. Fish and Wildlife Service, Panama City Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

#### *Public Hearing*

Section 4(b)(5) of the Act provides for one or more public hearings on this proposal, if requested. Requests must be received by the date listed above in **DATES**. Such requests must be sent to the address shown in **FOR FURTHER INFORMATION CONTACT**. We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings, as well as how to obtain reasonable accommodations, in the *Federal Register* and local newspapers at least 15 days before the hearing.

#### *Peer Review*

In accordance with our joint policy on peer review published in the *Federal Register* on July 1, 1994 (59 FR 34270), and our August 22, 2016, memorandum updating and clarifying the role of peer review of listing actions under the Act, we sought the expert opinions of six appropriate specialists regarding the SSA report, which informed this proposed rule. We received a response from one of the six peer reviewers.

The purpose of peer review is to ensure that our listing determination is based on scientifically sound data, assumptions, and analyses. The peer reviewers have expertise in crayfish biology, habitat, and stressors to the species. We invite any additional comment from the peer reviewers during this public comment period; these comments will be available along with other public comments in the docket for this proposed rule.

### **Previous Federal Action**

In 2010, the Center for Biological Diversity (CBD) petitioned the Service to list 404 aquatic, riparian, and wetland species from the Southeastern United States under the Act. The Panama City crayfish was among these 404 species. On September 27, 2011, the Service published a substantial 90-day finding for 374 of the 404 species, including the Panama City crayfish, soliciting information about, and initiating status reviews for, those species (76 FR 59836). In 2015, CBD filed a complaint against the Service for failure to complete a 12-month finding for the Panama City crayfish within the statutory timeframe. The Service entered into a settlement agreement with CBD to address the complaint; the court-approved settlement agreement specified that a 12-month finding for the Panama City crayfish would be delivered to the *Federal Register* by September 30, 2017. On September 21, 2017, the Court approved an extension, allowing the Service to submit this 12-month finding to the *Federal Register* no later than December 29, 2017.

### **Background**

A thorough review of the taxonomy, life history, and ecology of the Panama City crayfish (*Procambarus econfinae*) is presented in the SSA report, version 1.0 (Service 2017). The SSA report documents the results of our comprehensive biological status review for the Panama City crayfish, including an assessment of the potential stressors to



the species. The SSA report does not represent a regulatory decision by the Service on whether the species should be proposed for listing as an endangered or threatened species under the Act. It does provide the scientific basis that informs that decision, which involves the further application of standards within the Act and its implementing regulations and policies. The full SSA report can be found on the Service's Southeast Region website at <https://www.fws.gov/southeast/> and at <http://www.regulations.gov> under Docket No. FWS-R4-ES-2017-0061.

### *Species Description*

The Panama City crayfish is a small, semi-terrestrial crayfish that grows to about 2 inches (in) (50.8 millimeters (mm)) in length (minus claws), and is found in south-central Bay County, Florida. The species' color pattern consists of a medium dark-brown background color, lighter brown mid-dorsal stripe, and darker brown dorsolateral stripes (FWC 2016, p.1). The Panama City crayfish was first described by Hobbs in 1942 from Bay County, Panama City, Florida. Currently, the Panama City crayfish is classified in the family Cambaridae and is considered a valid taxon by the scientific community (Taylor et al. 1996, 2007; Integrated Taxonomic Information System 2017).

The life history of the Panama City crayfish specifically is not well known. Cambarid crayfish may live about 2.5 to 3 years (Hobbs 2001, p. 977), with a generation period of 2 years. For this family of crayfish, the majority breed more than once, with mating among mature yearlings frequent; however, many individuals do not become sexually active until late summer or fall. Females may produce between 30 and 160 eggs, and have been found with eggs and/or young from March through September. Juveniles are most frequently found in the summer and have been observed through

December, so young appear to be produced from at least March through December. Juveniles can be carried overland by sheet flow during rainy periods, which aids in dispersal (Keppner and Keppner 2002, p. 11).

Eight crayfish species are known to occur within the range of the Panama City crayfish, although only the hatchet crayfish, *Procambarus kilbyi*, and the jackknife crayfish, *Procambarus hubbelli*, are found in the same habitat as the Panama City crayfish and may co-occur with it (FWC 2017). The Panama City crayfish is not known to hybridize with other species of crayfish.

Historically, the species inhabited natural and often temporary bodies of shallow fresh water within open pine flatwoods and wet prairie-marsh communities. However, most of these communities have been cleared for residential or commercial development or replaced with slash pine plantations. The Panama City crayfish currently is known to inhabit the waters of grassy, gently sloped ditches and swales, slash pine plantations, utility rights-of-way and a few remnant parcels protected under wetland and private easements (FWC 2016, p. 2).

The highest densities of Panama City crayfish have been recorded in areas with little to no shrub or tree cover (FWC 2016, p.2). Suitable habitat is normally dominated by herbaceous vegetation. Lowest population densities have occurred in small, open sites where shrubs or trees were present, or in the furrows between bedding rows in some pine plantations (Keppner and Keppner 2005). When encountered in dense titi (*Cyrilla racemiflora* and *Cliftonia monophylla*) swamps, the species was associated with temporarily inundated areas open to the sun with some herbaceous vegetation. Such sites may be considered secondary or suboptimal habitat for the species. On sites where mixed

habitat features are present (e.g., partially wooded sites or sites with permanent, deep-water ponds), the Panama City crayfish appears to select favorable areas dominated by herbaceous vegetation, with shallow or fluctuating water levels (FWC 2016, p. 3; Keppner and Keppner 2005).

The Panama City crayfish relies on particular soil types for burrow construction and supporting the herbaceous vegetation; these soil types are categorized as core or secondary soils. Core soils provide the best substrate to support the species; secondary soils are less ideal but still used. The core and secondary soil types that support Panama City crayfish within their known range are described in more detail in the SSA report (Service 2017, pp. 23–24).

Panama City crayfish build burrows for shelter and are categorized as secondary burrowers, which are normally in surface water when it is present on the hydric soils they inhabit (Hobbs 1981). They construct burrows that contact the water table as the surface water of their habitat recedes, and they occupy burrows when surface water is absent or during periods of extreme water temperatures. They emerge from the burrows when surface water is present again or water temperatures are favorable. It appears that they can survive significant periods of drought in their burrows when they can maintain contact with the water table. During these dry periods the Panama City crayfish excavates and lives in unbranched burrows up to three feet long that extend down to the water table, thereby enabling the species to remain adequately hydrated and survive (FWC 2016, p. 3).

Little is known about the specific feeding habits of the Panama City crayfish. Observations on Panama City crayfish that were held in aquaria spanning 1.5 plus years

(Keppner 2014) indicate that they are detritivores and herbivores. Specimens were offered dead animal material, but they avoided it in favor of processing the substrate for particles of prepared fish food and the fresh aquatic vegetation that were provided as primary food sources. Herbaceous vegetation likely serves as a food source for the Panama City crayfish.

The Panama City crayfish historically ranged throughout south-central Bay County, Florida within a 56 square mile area (see Figure 1). The historical range likely created one population connected by core and secondary soils. As urban growth came to Panama City, the range became fragmented and isolated patches. Today, the species has 13 localized populations that can be divided into two distinct groups: the western and eastern group. The western group includes 8 separate populations and the eastern group includes 5 separate populations. The 13 populations are described in more detail in the SSA report (Service 2017, pp. 35-54).

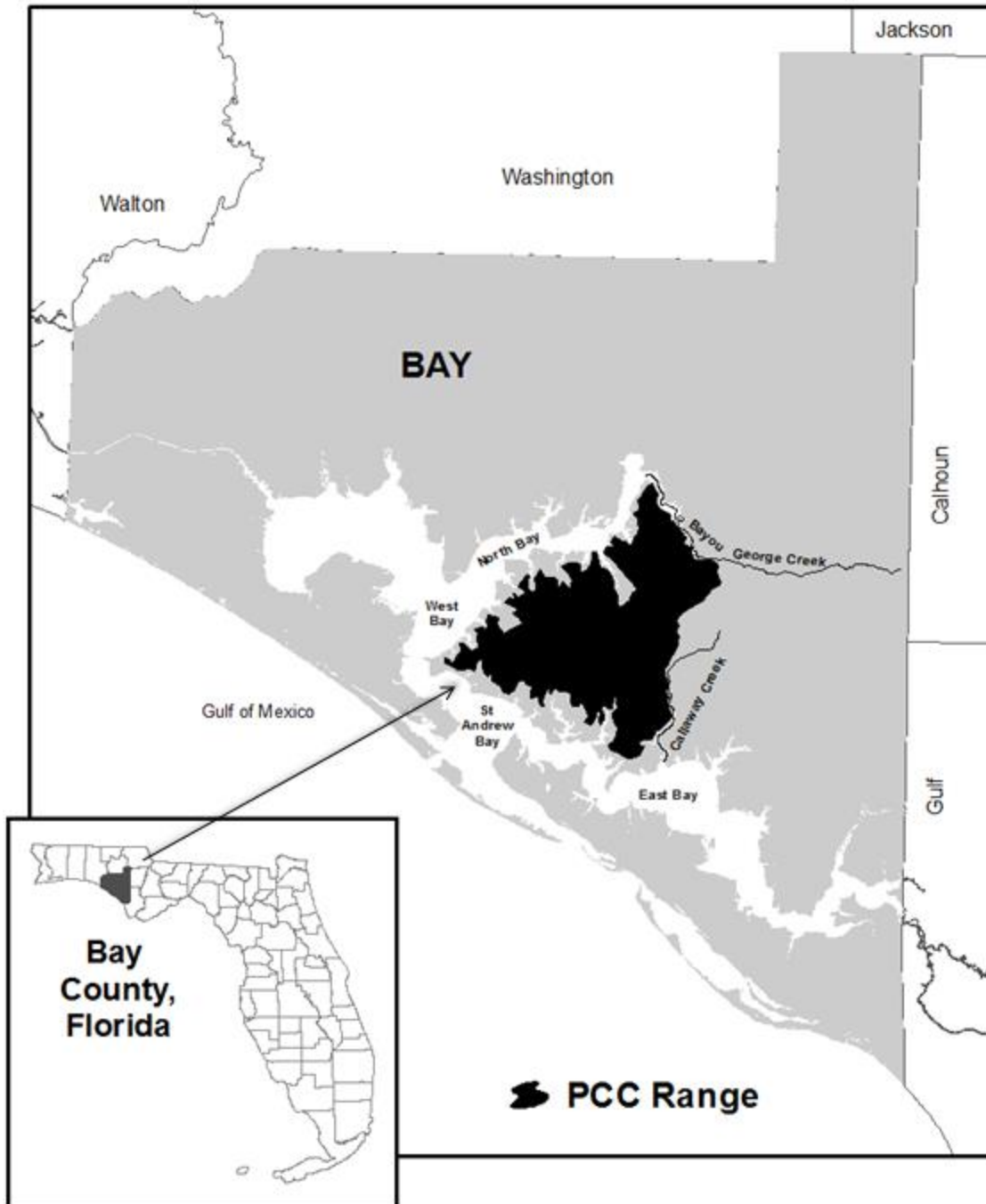


Figure 1. Range of the Panama City crayfish.

### *Species Needs and Viability*

The Panama City crayfish needs freshwater wetlands that support herbaceous vegetation, which is important to the Panama City crayfish for food, shelter, and detritus formation. The species needs core or secondary soils to provide the proper sediment structure for burrow construction and to support the herbaceous vegetation. The Panama City crayfish needs access to groundwater (through burrowing) or surface water to prevent desiccation of individuals and populations. The species needs both adequate water quality and quantity to fulfill its life history.

We describe the Panama City crayfish's viability by characterizing the status of the species in terms of its resiliency (ability of the populations to withstand stochastic events), redundancy (ability of the species to withstand large-scale, catastrophic events), and representation (the ability of the species to adapt to changing environmental conditions). Using various time frames and the current and projected resiliency, redundancy, and representation, we describe the species' level of viability over time. For the Panama City crayfish to maintain viability, its populations or some portion thereof must be resilient. A number of factors influence the resiliency of Panama City crayfish populations, including the inbreeding coefficient, population isolation, and population abundance. Elements of Panama City crayfish habitat that determine whether Panama City crayfish populations can grow to maximize habitat occupancy influence those factors, thereby increasing the resiliency of populations. These demographic and habitat factors are discussed here; for each factor, we assigned a condition category of high, medium, or low (see Table 1). We evaluated each population and assigned it a high, medium, or low condition category for each factor, as well as an overall condition.

**Table 1. Demographic and habitat factors for Panama City crayfish (Service 2017, p. 64).**

Condition category	Demographic Factors			Habitat Elements		
	Inbreeding Coefficient	Population Isolation	Population Abundance	Freshwater Quality & Quantity	Herbaceous Ground Cover	Suitable Habitat
High	>0.400	< 0.5 km	>51	<33% developed and unsuitable	easements or ROW with >15 acres that is managed	>800 acres
Moderate	0.200–0.400	0.5–2.0 km	21–50	33–66% developed and unsuitable	easements or ROW with ≤15 acres suitable habitat that is managed; or timber lands	100–800 acres
Low	< 0.200	> 2 km	1–20	>66% developed and unsuitable acres	no managed lands, habitat currently a titi monoculture	<100 acres

**Population Isolation:** least-cost path distance to nearest population in kilometers.

**Population Abundance:** based on population sampling counts from all conducted surveys recorded.

**Freshwater Quality & Quantity:** Percentage of developed and unsuitable acres within the area supporting each population.

**Herbaceous Ground Cover:** Includes land with and without easements, size of easements, and management activities.

**Suitable Habitat:** Acres of undeveloped core and secondary soils within the area supporting each population.

Inbreeding coefficient: The Panama City crayfish, once connected through core and secondary soils within a 56 square mile area, is now separated into 13 populations that, when combined, total a significantly smaller area than occupied by the historical, interconnected population. A recent genetic analysis of population differentiation and clustering to assess population structure of the Panama City crayfish quantified each

population's inbreeding coefficient numbers (Duncan et al. 2017). An inbreeding coefficient number shows the probability of inheriting two copies of the same allele from an ancestor that occurs on both sides of the pedigree. For Panama City crayfish populations, the differences in inbreeding coefficient numbers likely correspond to patterns of fragmentation from urban development and not necessarily from selective pressures maintaining adaptive differences. Little work has been done on the population genetics of wild crayfish populations. We have no comparison for values in crayfish species of expected inbreeding coefficients (Duncan et al. 2017), and treat this as a relative measure. Thus, we ranked individual populations into three numerically distinct breaks: Low when inbreeding coefficients were less than 0.200, moderate when they ranked between 0.200-0.400, and high when results were greater than 0.400.

Population isolation: To promote genetic connectivity in Panama City crayfish, we must have an understanding of their potential abilities to move between populations. One working hypothesis was that ditches within the range promote movement, especially during flooding events. This idea is supported by observations of some localized movements of Panama City crayfish into previously unoccupied ditches after recent flooding where they were not seen in these new locations during the next sampling event.

Because the landscape occupied by the Panama City crayfish is spatially heterogeneous, it is important to understand how certain landscape features affect the species' ability to move in order to meet requirements for foraging, migration, or other movement-dependent processes (Crooks and Sanjayan 2006 as cited in Duncan et al. 2017). We relied on a landscape "Least Cost Path" land cover analysis conducted by Duncan et al. (2017) to assist in determining what may affect genetic connectivity in



Panama City crayfish and inform our understanding of population isolation.

Population abundance: The size of an individual population coupled with age and sex classifications can be used as an indicator of resiliency. Within the SSA report, we have summarized the years that surveys of varying levels were completed within each population. The protocol currently used for PCC monitoring typically depends on dip-net sampling when sufficient surface water is present and nondestructive evaluation of crayfish burrows. The protocol can miss specimens in vegetation and does not sample individuals living below ground in burrows, and we currently do not have an estimate of detection probability using this protocol. The protocol is quantitative and results in a catch per standard unit effort estimate of the population. We use population counts to assess the relative population size across the range of the species.

Freshwater quality and quantity: Although crayfish are facultative air breathers, moisture is required to facilitate the respiratory process (Longshaw and Stebbing 2016, p. 327). Burrowing to groundwater or access to surface water are both important habitat features needed to prevent desiccation of individuals and populations. Declines in water quality are known to present a significant threat to other species of crayfish (and presumably to PCC). These declines can range from oxygen-deficient conditions resulting from algal blooms, sewage spills, or localized leaks to pollution originating from roadway runoff or chemical spills (Acosta and Perry 2001). The Panama City crayfish often inhabits ditches and swales close or adjacent to commercial and private properties, which may affect the water quality at these sites. We used a proxy measure of water quality and quantity based on the amount of development surrounding the population. We assumed that greater acreage in developed and unsuitable landcover types

(which includes transportation and other development-related types) is correlated with declines in this habitat element.

Herbaceous ground cover: Herbaceous vegetation is important to the Panama City crayfish for food, detritus formation, and cover. Absence of vegetation increases exposure of this small crayfish to predation and reduces availability of food.

Suitable habitat: Species sampling efforts and a recent landscape modeling analysis support the theory that the Panama City crayfish almost exclusively relies on core and secondary soils. These soils provide the sediment structure needed for burrow construction to the water table and also support the herbaceous vegetation upon which the species relies for food and cover. Lands supporting the Panama City crayfish must be of sufficient size to sustain a population, but we don't know the minimum size, as many factors influence a Panama City crayfish population, including other habitat conditions. The recent work of Duncan et al. (2017) showed that all remaining populations with >800 acres of suitable habitat supporting them were genetically healthy, and population counts support this as well.

Maintaining representation in the form of genetic or ecological diversity is important to maintain the Panama City crayfish's capacity to adapt to future environmental changes. The 13 remaining populations show relatively high genetic differentiation with inbreeding coefficients ranging from 0.214 to 0.493 and associated acreages of suitable habitat ranging from 5 acres to 5,309 acres.

Redundancy reduces the risk that a large portion of the species' range will be negatively affected by a natural or anthropogenic catastrophic event at a given point in time. Species that have resilient populations spread throughout their historical range are

less susceptible to extinction (Carroll et al. 2010; Redford et al. 2011). The Panama City crayfish historically lacked redundancy in that its historical range consisted of one population of interconnected soils. Today, there is a distinct genetic difference between individual patches located in the western range versus individual patches within the eastern range, which likely corresponds to patterns of fragmentation from urban development as well as some natural wetland buffers (creeks, stream bodies) (Duncan et al. 2017).

### **Summary of Biological Status and Threats**

We completed a comprehensive assessment of the biological status of the Panama City crayfish, and prepared a report of the assessment, which provides a thorough account of the species' overall viability. In this section, we summarize the conclusions of that assessment, which can be accessed at Docket No. FWS–R4–ES–2017–0061 on <http://www.regulations.gov>.

#### *Summary of Factors Affecting the Species*

The Act directs us to determine whether any species is an endangered species or a threatened species because of any factors affecting its continued existence. We reviewed the potential risk factors (i.e., threats, stressors) that could be affecting the Panama City crayfish now and in the future. In this proposed rule, we will discuss in detail only those factors that could meaningfully impact the status of the species. The primary risk factors (i.e., threats) affecting the status of the Panama City crayfish are habitat loss and degradation, habitat fragmentation, and subpopulation isolation due to development (Factor A from the Act). Additional stressors to the species include collection for bait (Factor B), disease (Factor C), off-road vehicle use (Factor A), and insecticide

application (Factor E); however, our analysis shows that while these stressors may be impacting individual Panama City crayfish, they are not having species-wide impacts. For a full description of all identified stressors, refer to chapter 4 of the SSA report (Service 2017).

#### Factor A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Development projects and land conversion can result in direct loss of habitat, as well as fragmentation and isolation of populations. The effects of development may also include alterations to water quality and quantity. Historically, the Panama City crayfish inhabited natural and often temporary bodies of shallow fresh water within open pine flatwoods and wet prairie-marsh communities (Hobbs 1942). The Panama City crayfish's natural habitat (wet pine flatwoods) has been lost or degraded through residential, commercial, and industrial development, as well as conversion to intensive pine silviculture and for ranching and farming uses. It is likely that no unaltered natural pine flatwoods remain within the Panama City crayfish's current range.

Most known Panama City crayfish occurrences are in human-altered habitats and are vulnerable to further loss or alteration. Although artificial habitats such as roadside ditches and rights-of-way have allowed the Panama City crayfish to persist in areas from which they would otherwise likely have been extirpated, human activities can alter the hydrology and configuration of these sites, making them unsuitable for long-term Panama City crayfish persistence. For example, roadside ditch maintenance and construction activities have resulted in the destruction of several crayfish sites.

While ditch maintenance activities may have temporary negative impacts on the species, if conducted using conservation management principles, they may provide long-term habitat improvements that support Panama City crayfish presence. For example, the design of the ditch helps determine whether it can support Panama City crayfish. Swales and ditches with herbaceous vegetation and a 3:1 or shallower slope are more likely to support Panama City crayfish than ditches with a steeper slope (FWC 2017, p. 22).

Infrastructure development has impacted, or is anticipated to impact, several crayfish sites (Keppner and Keppner 2001, pp. 13–14, 2004, p. 9). For example, several proposed road construction or expansion projects, such as the widening of Star Avenue and Kern Avenue and the widening and hardening of Tram Road, may impact Panama City crayfish habitat in the future. Infrastructure development can eliminate suitable Panama City crayfish habitat by removing the required herbaceous vegetation and digging up the surrounding soils.

Silvicultural practices such as ditching and bedding, roller chopping, installing fire breaks, and constructing roads can alter the hydrology of Panama City crayfish sites, create physical barriers to crayfish movement, and destroy underground burrows (Hobbs 2001, p. 988; Keppner and Keppner 2001, p. 13, 2004, p. 10; FWC 2006, p. 10). These activities may contribute to the isolation of Panama City crayfish populations. Fire suppression and high tree density on silvicultural sites can reduce herbaceous groundcover necessary for suitable crayfish habitat (Keppner and Keppner 2001, p. 13, 2004, p. 10; FWC 2006, p. 27). Similarly, removal of tree canopy cover, changes in ground cover vegetation, and associated changes in water quality and surface water availability are all possible changes associated with the effects of conversion to farming

and ranching practices, such as cattle grazing (e.g., Jansen and Robertson 2001, pp. 71–73). These activities negatively impact the habitat of the Panama City crayfish. Although minimal changes are expected to occur due to farming and ranching practices, conversion from silviculture to grazing use has occurred on lands adjacent the crayfish’s range.

Freshwater crayfish may be sensitive to declines in water quality and declines have been identified as a threat to other crayfish species. Water quality declines can range from oxygen-deficient conditions resulting from algal blooms or sewage spills to pollution originating from roadway runoff, pesticide applications, or chemical spills (Acosta and Perry 2001, p. 46). Given the level of development throughout the range of the Panama City crayfish and the occurrences of Panama City crayfish adjacent to private properties, runoff from roads or improper application of chemicals, such as pesticides or fertilizers, may negatively impact water quality and have direct impacts on the species.

The majority of known Panama City crayfish occurrences in the western part of the range are in roadside ditches and swales that are isolated from other Panama City crayfish populations by roads, development, and land use changes. Fragmentation and isolation can increase vulnerability to local extirpation due to adverse genetic, demographic, and environmental events. Further, when Panama City crayfish have been extirpated from an area, lack of habitat connections between sites can prevent Panama City crayfish from recolonizing the newly vacant sites (FWC 2006, p. 10). Recent genetic work indicates the isolation in the western portion of the range has resulted in inbreeding and drift (Duncan et al. 2017, p. 17).

In addition to the effects on habitat described above, many of the activities contributing to habitat loss and degradation can also directly harm or kill Panama City

crayfish. Continuous loss of individuals can eventually lead to extirpation of isolated populations. In particular, roadside maintenance, dredging, and infrastructure development in roadside ditches and silvicultural and farming activities, if done without appropriate safeguards, have the potential to kill, harm, or displace Panama City crayfish due to the removal by heavy machinery of soil from crayfish sites. In addition, fill placed on sites in preparation for construction activities can entomb crayfish in their burrows

Off-road vehicle use may impact the Panama City crayfish by crushing, as well as impacting the habitat through rutting of the soil and destruction of vegetation (FWC 2016, p. 11). Off-road vehicle use has been documented in areas within the eastern part of the Panama City crayfish's range along Gulf Power rights-of-way. Gulf Power has blocked access to these rights-of-way with gates, so access to these areas is limited and we do not expect off-road vehicle use is resulting in species-wide impacts.

#### Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Crayfish may be recreationally harvested for fish bait. Within the range of the Panama City crayfish, several of the areas where the species occurs are known to be utilized by locals collecting fish bait (FWC 2016, p.11; Keppner and Keppner 2001, 2005). However, although harvesting individual crayfish at these sites has been documented, the actual species collected are unknown. Therefore, while harvesting crayfish may be impacting individual Panama City crayfish, we find that it is not having a species-wide impact.

Florida State Code 68A-9.002 authorizes the Director of the Florida Fish and Wildlife Conservation Commission to issue permits to collect any wildlife species for

“scientific, educational, exhibition, propagation, management or other justifiable purposes.” Permits have been issued for biologists conducting surveys on the Panama City crayfish; however, the Panama City crayfish is not known to be targeted for significant scientific or educational collections.

#### Factor C. Disease or Predation

Disease agents and pests identified for freshwater crayfish include viruses, bacteria, rickettsia-like organisms, fungi, protistans, and metazoans (Evans et al. 2002, p. 1). There is no reported information on the presence of disease or parasites in the Panama City crayfish to date. Nothing indicates that predation or competition by native or non-native predators is currently affecting Panama City crayfish at the species level.

#### Factor D. The Inadequacy of Existing Regulatory Mechanisms

The following existing regulatory mechanisms were considered and discussed as they relate to the stressors, under the applicable Factors, affecting the Panama City crayfish: Florida State Code 68A-9.002 (Factor B).

The Panama City crayfish is currently identified as a State Species of Special Concern in Florida (Florida State Code 68A-27.005). Species of Special Concern require individuals to obtain a permit from the FWC Executive Director in order to take, possess, transport, or sell the species.

FWC has developed voluntary draft guidelines for developers to consider when undertaking projects that may impact Panama City crayfish and its habitat (FWC 2016). However, these guidelines are not regulatory in nature. We are not aware of any regulatory mechanisms in place to address the threat of habitat loss, fragmentation, and degradation due to development.



#### Factor E. Other Natural or Manmade Factors Affecting Its Continued Existence

The Service considered several additional stressors to the Panama City crayfish, including chemical application and sea level rise.

Mosquitocides are used within the range of the Panama City crayfish to treat both larval and adult mosquitoes. The mosquitocides registered for use within the range of the Panama City crayfish do not pose known threats to water quality if applied per label directions (FWC 2016, p. 10). Fertilizers, insecticides, and herbicides may pose a risk to Panama City crayfish if applied inappropriately.

The Panama City crayfish was included in a statewide vulnerability assessment for approximately 1000 species in Florida (Reece et al. 2013, Hoyer et al. 2014) using a Standardized Index of Vulnerability and Value Assessment (SIVVA; Reece and Noss 2014). Based on the data used in this assessment, the Panama City crayfish did not meet the vulnerability assessment criteria. The assessment used a 10 meter digital elevation model “bathtub” projection that showed 2 meters of sea level rise and overlapped these projections with species’ ‘element occurrences.’ (Reece et al 2013). The assessment focused on those species which had 50% or more of their occurrences intersecting with the sea level rise projection. The Panama City crayfish did not meet this criteria. Overall, little suitable habitat for Panama City crayfish will be affected by sea level rise (Hoyer et al. 2014).

#### *Conservation Actions*

Several private lands within the Panama City crayfish’s range are being managed under conservation easements for the species. These easements largely cover wet pine flatwoods and wet prairie habitats. Other private lands are inaccessible to surveyors, but

if they lack significant disturbance and have suitable habitat for the species, they are likely occupied by Panama City crayfish.

Areas in silviculture adjacent to human-altered habitats may serve as refuges for Panama City crayfish, and silvicultural BMPs require operators to minimize impacts to Panama City crayfish. Use of BMPs for agriculture and grazing can also help minimize impacts to aquatic species (e.g., Florida Department of Agriculture and Consumer Services 2008, p. 1). Gulf Power Company manages rights-of-way along approximately 114 acres of land that is populated by the Panama City crayfish. The Service and FWC have a management agreement that provides recommended BMPs to Gulf Power Company; the management practices through this agreement have proven effective as the crayfish continue to thrive within the easement areas.

#### *Current Condition*

The historical range of the Panama City crayfish included a 56-square-mile area in Bay County, Florida. It was likely one contiguous population within open pine flatwoods and prairie-marsh communities providing connectivity across the landscape. Currently, the species is found in 13 genetically distinct populations within the boundaries of its historical range. Within its range, 61 percent (9,180 acres) of habitat with core soils and 46 percent (5,646 acres) of habitat with secondary soils remain undeveloped, and the total amount of available suitable habitat based on soils is 54 percent of the historical habitat available to the species.

The current condition is a qualitative estimate based on an analysis of the three population factors (inbreeding, population isolation, and population sampling/relative abundance) and three habitat elements (water quality/availability, herbaceous ground

cover, and suitable habitat). Overall population and habitat condition rankings were determined by combining the three population factors and three habitat elements using the most frequent score for individual factors as the overall score. Of the 13 populations described, the current conditions show 4 (31 percent) populations are estimated to have high resiliency, 5 (38 percent) moderate resiliency, and 4 (31 percent) low resiliency. In the western group of populations, 4 populations have low resiliency, 3 populations have moderate resiliency, and 1 has high resiliency. In the eastern group, 2 populations have moderate resiliency and 3 populations have high resiliency. Generally, genetic variation is low and inbreeding is high across the range, which indicate a high degree of current population isolation. This pattern is generally more pronounced in the sampling locations in the west (heavily urbanized areas).

#### *Future Condition*

For the purpose of this assessment, we define viability as the ability of the species to sustain populations in the wild over time. This discussion explains how the stressors associated with habitat loss, fragmentation, and degradation from residential and commercial development will influence resiliency, redundancy, and representation for the Panama City crayfish throughout its current known range using a series of plausible scenarios for 2030, 2050, and 2070. We predicted both future population factors (inbreeding and population isolation) and habitat factors (water quality and quantity, herbaceous ground cover, and suitable habitat) and evaluated these to inform our future conditions.

To predict potential future changes related to urban growth, we used layers from the Southeast Regional Assessment Project (SERAP, from the Biodiversity and Spatial Analysis Center at North Carolina State University; 60m resolution), a modification of

the SLEUTH Projected Urban Growth model (Jantz et al. 2010, entire; Terando et al. 2014, entire). SERAP identifies the parameters in global and regional models that are most likely to affect the Southeast region's climate and local landscape dynamics, with the goal of providing decision makers with information about low-probability, high-impact climate extremes through downscaled models and threats analysis. We used these products to map future predicted changes in urbanization in 2030, 2050, and 2070. The uncertainty associated with the SLEUTH model increases in time, as the species' response to the dynamic nature of the variables becomes less predictive. There is a greater confidence in predicting potential development and the species' response to changes in the landscape in the near future rather than the distant future.

To address uncertainty associated with the degree and extent of potential future stressors and their impacts on species' requisites, the 3Rs were assessed using three scenarios: status quo development (i.e.,  $\geq 80$  percent probability of occurring), moderate development ( $\geq 30$  percent probability of occurring), and high development ( $\geq 0$  percent probability of occurring). The scenarios included projecting possible future development using the SERAP model (Jantz et al. 2010, entire; Terando et al. 2014, entire). They also describe the predicted effects of the development on loss and fragmentation of suitable habitat rangewide and on each of 11 known populations, and draw inferences about population health based on the work of Duncan et al. (2017, entire). We excluded two populations (College Point and City of Lynn Haven) from our scenario analysis due to insufficient available data. Please refer to the SSA report (Service 2017) for the full analysis of the future scenarios.

In scenario one, the “status quo” scenario, we considered the development most likely to occur. Based on the SERAP model, this was development with a  $\geq 80$  percent probability. Under this scenario, Panama City crayfish will lose 1,401 to 3,096 acres of habitat rangewide as developed land increases from 20,221 to 25,040 acres. This loss, fragmentation, and degradation of habitat would reduce the number of resilient populations in high or moderate condition from nine currently to five by 2050. This loss of resiliency comes from both a reduction in habitat elements as well as the effects of isolation and drift on the populations themselves.

Under the “status quo” scenario, only one resilient population (the St. Joe population) is predicted to remain in the western group by 2050. This results in a loss of redundancy and representation, as only one resilient population will remain in the western group. In the eastern group, four resilient populations are predicted to persist through 2070.

In scenario two, the “intermediate development” scenario, we considered development with a moderate potential to occur. Based on the SERAP model, this was development with a  $\geq 30$  percent probability of occurring. In this scenario, the Panama City crayfish will lose 2,252 to 4,854 acres of habitat rangewide as developed land increases from 20,221 to 27,332 acres. This loss, fragmentation, and degradation of habitat is predicted to reduce the number of resilient populations in high or moderate condition from nine currently to four by 2070. This loss of resiliency comes from both a reduction in habitat elements as well as the effects of isolation and drift on the populations themselves.

Under the “intermediate development” scenario, only one resilient population (the St. Joe population) is predicted to remain in the western group by 2050. This results in a loss of redundancy and representation, as only one resilient population will remain in the western group. In the eastern group, three resilient populations are predicted to persist through 2070.

In scenario three, “high development” or “worst case” scenario, we considered the development that is least likely to occur. Based on the SERAP model, this was development with at >0 percent probability of occurring. In this scenario, the Panama City crayfish will lose 3,233 to 6,130 acres of habitat rangewide as developed land increases from 20,221 to 28,899 acres. This loss, fragmentation, and degradation of habitat is predicted to reduce the number of resilient populations in high or moderate condition from nine currently to three by 2070. This loss of resiliency comes from both a reduction in habitat elements as well as the effects of isolation and drift on the populations themselves.

Under the “high development” scenario, all resilient populations in the western group are predicted to be lost by 2050, resulting in a loss of all representation and redundancy in the western group. In the eastern group, three resilient populations are predicted to persist through 2070.

### **Determination**

Section 4 of the Act (16 U.S.C. 1533), and its implementing regulations at 50 CFR part 424, set forth the procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the Act, we may list a species based on: (A) The present or threatened destruction, modification, or

curtailment of its habitat or range; (B) Overutilization for commercial, recreational, scientific, or educational purposes; (C) Disease or predation; (D) The inadequacy of existing regulatory mechanisms; or (E) Other natural or manmade factors affecting its continued existence.

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the Panama City crayfish. Our analysis of this information indicates that, at the species level, habitat development (Factor A) is the primary factor affecting the Panama City crayfish now and into the future. There may be additional infrastructure projects (e.g. roads, ditches, etc.) that affect the hydrology within the range of the Panama City crayfish as a result of forest clearing for permanent rights of way or silviculture. Additionally, the current level of habitat fragmentation (Factor A) further isolates populations, which reduces gene flow and limits the potential for the species to disperse. In addition, we have no evidence that ORV use (Factor A), overutilization (Factor B) or disease (Factor C) is affecting populations of Panama City crayfish.

The Act defines an endangered species as any species that is “in danger of extinction throughout all or a significant portion of its range.” We find that an endangered species status is not appropriate for the Panama City crayfish because the species maintains multiple resilient populations across its historical range and the risk is low that the species would not persist in the near term; in other words, the risk of the Panama City crayfish significantly declining in the near term is low given that it has persisted despite historical levels of habitat loss. The current conditions as assessed in the Panama City crayfish SSA report show that only 43 to 54 percent of the original lands

historically available to the Panama City crayfish remain potentially available for use by the Panama City crayfish. However, while the species' habitat has been reduced by at least 46 percent, the species currently consists of 13 populations, 9 of which are highly to moderately resilient and found across its historical range. Further, despite changes to the crayfish's natural habitat of wet pine flatwoods, the species currently persists using artificial habitats such as roadside ditches and rights-of-way although these sites may become unsuitable long term due to anthropogenic activities that can alter their hydrology or configuration. Therefore, we conclude that the current risk of extinction of the Panama City crayfish is sufficiently low that it does not meet the definition of an endangered species under the Act.

The Act defines a threatened species as any species that is "likely to become endangered throughout all or a significant portion of its range within the foreseeable future." We find that the status of the Panama City crayfish meets the definition of a threatened species. Based on the biology of the species and the threats acting on it, the foreseeable future used in the determination was 20 to 30 years. The generation time for the species is 2 years with a life-span up to 3.5 years; the period of 20–30 years encompasses 10–15 generations, which is more than sufficient time to determine the species' response to the stressors. Although the future scenarios, which were snapshots in time for predicting resiliency, redundancy, and representation extended through 2070, the uncertainty as to the outcomes with regard to the responses to the stressors became so great as to render the scenarios too unreliable beyond 2050 for that time period to be considered the foreseeable future.



Habitat fragmentation and isolation have contributed to the partitioning into 13 populations. While the Panama City crayfish faces a variety of threats, only one threat, habitat loss and degradation, habitat fragmentation, and subpopulation isolation due to urban development, was considered an important factor in our assessment of the future viability of the Panama City crayfish. Based on our future scenarios for urban development, we predict major losses of resiliency, representation, and redundancy for Panama City crayfish in the foreseeable future. Especially problematic is the predicted complete loss of resilience and redundancy from the western populations, which reduces half of the representation of Panama City crayfish. These combined losses under even the most probable status quo scenario make the ability of Panama City crayfish to sustain its populations into the foreseeable future questionable assuming current levels of protection and management.

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the Panama City crayfish. Habitat loss from development is occurring rangewide and has resulted in the fragmentation of the landscape. The fragmentation of suitable habitat has caused the isolation of existing populations limited to ditches, swales, slash pine plantations, and utility rights-of-ways. At the population level, Panama City crayfish now exists in 13 populations. Currently, four populations are estimated to maintain high resiliency; five are estimated to have moderate resiliency; and four are estimated to have low resiliency, including the two populations that are in the low condition but were excluded from future scenario analysis because of inadequate data.

At the species level, the 13 Panama City crayfish populations are broken down into an eastern group of five populations and a western group of eight populations based on the characteristics of Panama City crayfish and its geographic distribution. Currently, four populations, all in the west, are in low condition, including the two that were excluded from future condition analysis because of inadequate data. These two populations represent 31 percent of the known populations overall and 50 percent of the western group, and, although still in existence, they may not contribute to the future redundancy of Panama City crayfish, because the populations are already experiencing genetic drift and the habitat that supports them is susceptible to future development.

All future scenarios predicted a negative impact on the redundancy of Panama City crayfish. Under the “status quo” scenario, 62 percent of populations are in low condition by 2050; this percentage increases to 69 percent under the “intermediate development” scenario and to 77 percent under the “high development” scenario. The greatest loss of redundancy for Panama City crayfish is predicted to occur in the western group. In this group, 100 percent of the populations are in low condition by 2050 under the “high development” scenario and 88 percent under the other two scenarios. In the eastern group, three populations are predicted to remain strongholds for Panama City crayfish, although they would represent only 60 percent of the remaining eastern populations.

At the species level, we estimate that the Panama City crayfish currently has low to moderate adaptive potential across its range, and all of the future scenarios are predicted to have an impact on the species’ representation during the 50-year time horizon. Even though Panama City crayfish has low representation in the western group,

with only two of the eight populations not in low condition, these two populations likely will persist because of the protection afforded through conservation easements. The eastern group comprises a much larger area and contains the three populations currently in high condition. However, two of these populations, Highpoint and 231-north, are predicted to be in low condition in the future. This is especially concerning given that the Highpoint population contains unique genetic diversity not found in other populations, although more work is needed to confirm this (Duncan et al. 2017, p. 19).

In short, based on our analysis of the species' current and future conditions, as well as the conservation efforts discussed above, we conclude that the population and habitat factors used to determine the resiliency, representation and redundancy for Panama City crayfish will continue to decline so it is likely to become in danger of extinction throughout its range within the foreseeable future. Therefore, on the basis of the best available scientific and commercial information, we propose listing the Panama City crayfish as threatened in accordance with sections 3(6) and 4(a)(1) of the Act.

Under the Act and our implementing regulations, a species may warrant listing if it is endangered or threatened throughout all or a significant portion of its range. Because we have determined that the Panama City crayfish is threatened throughout all of its range, under the Final Policy on Interpretation of the Phrase "Significant Portion of Its Range" in the Endangered Species Act's Definitions of "Endangered Species" and "Threatened Species" (79 FR 37577, July 1, 2014) (SPR Policy), if a species warrants listing throughout all of its range, no portion of the species' range can be a "significant" portion of its range. ). While it is the Service's position under the SPR Policy that undertaking no further analysis of "significant portion of its range" in this circumstance is

consistent with the language of the Act, we recognize that the Policy is currently under judicial review, so we also took the additional step of considering whether there could be any significant portions of the species' range where the species is in danger of extinction. We evaluated whether there is substantial information indicating that there are any portions of the species' range: (1) that may be "significant," and (2) where the species may be in danger of extinction. In practice, a key part of identifying portions appropriate for further analysis is whether the threats are geographically concentrated. The threats affecting the species are throughout its entire range; therefore, there is not a meaningful geographical concentration of threats. As a result, even if we were to undertake a detailed SPR analysis, there would not be any portions of the species' range where the threats are harming the species to a greater degree such that it is in danger of extinction in that portion.

### **Critical Habitat**

Section 4(a)(3) of the Act, as amended, and implementing regulations in 50 CFR 424.12, require that, to the maximum extent prudent and determinable, we designate critical habitat at the time the species is determined to be an endangered or threatened species. Critical habitat is defined in section 3 of the Act as:

(1) The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (a) essential to the conservation of the species and (b) Which may require special management considerations or protection; and

(2) Specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the Act, upon a determination by the Secretary of the Interior that such areas are essential for the conservation of the species.

Our regulations (50 CFR 424.12(a)(1)) state that the designation of critical habitat is not prudent when any of the following situations exist: (1) The species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of threat to the species, or (2) such designation of critical habitat would not be beneficial to the species. The regulations also provide that, in determining whether a designation of critical habitat would not be beneficial to the species, the factors that the Service may consider include, but are not limited to, whether the present or threatened destruction, modification, or curtailment of a species' habitat or range is not a threat to the species, or whether any areas meet the definition of "critical habitat" (50 CFR 424.12(a)(1)(ii)).

As discussed above, there is no evidence that collection or vandalism are threats to the species, and there is no indication that identification and mapping of critical habitat is likely to initiate any such threats. Therefore, in the absence of finding that the designation of critical habitat would increase threats to the species, if there are benefits to the species from a critical habitat designation, a finding that designation is prudent is appropriate.

The potential benefits of designation may include: (1) Triggering consultation under section 7 of the Act, in new areas for actions in which there may be a Federal nexus where it would not otherwise occur because, for example, it is unoccupied; (2) focusing conservation activities on the most essential features and areas; (3) providing

educational benefits to State or county governments or to private entities; and (4) preventing people from causing inadvertent harm to the protected species. Because designation of critical habitat would not likely increase the degree of threat to the species and may provide some measure of benefit, designation of critical habitat is prudent for the Panama City crayfish.

Our regulations (50 CFR 424.12(a)(2)) further state that critical habitat is not determinable when one or both of the following situations exists: (1) Information sufficient to perform required analysis of the impacts of the designation is lacking; or (2) the biological needs of the species are not sufficiently well known to permit identification of an area as critical habitat. A careful assessment of the economic impacts that may occur due to a critical habitat designation is ongoing, and we are in the process of working with the States and other partners in acquiring the complex information needed to perform that assessment. Until these efforts are complete, information sufficient to perform a required analysis of the impacts of the designation is lacking, and, therefore, we find designation of critical habitat for this species to be not determinable at this time.

#### **Available Conservation Measures**

Conservation measures provided to species listed as endangered or threatened species under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness, and conservation by Federal, State, Tribal, and local agencies; private organizations; and individuals. The Act encourages cooperation with the States and other countries and calls for recovery actions to be carried out for listed species. The

protection required by Federal agencies and the prohibitions against certain activities are discussed, in part, below.

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Subsection 4(f) of the Act calls for the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The recovery planning process involves the identification of actions that are necessary to halt or reverse the species' decline by addressing the threats to its survival and recovery. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

Recovery planning includes the development of a recovery outline shortly after a species is listed and preparation of a draft and final recovery plan. The recovery outline guides the immediate implementation of urgent recovery actions and describes the process to be used to develop a recovery plan. Revisions of the plan may be done to address continuing or new threats to the species, as new substantive information becomes available. The recovery plan also identifies recovery criteria for review of when a species may be ready for downlisting (i.e., reclassification from endangered status to threatened status) or delisting (i.e., removal from the List), and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Recovery teams (composed of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) are often established to develop

recovery plans. When completed, the recovery outline, draft recovery plan, and the final recovery plan will be available on our website (<http://www.fws.gov/endangered>), or from our Panama City Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, Tribes, nongovernmental organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (e.g., restoration of native vegetation), research, captive propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their ranges may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private, State, and Tribal lands. If this species is listed, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the Act, the State of Florida would be eligible for Federal funds to implement management actions that promote the protection or recovery of the Panama City crayfish. Information on our grant programs that are available to aid species recovery can be found at: <http://www.fws.gov/grants>.

Although the Panama City crayfish is only proposed for listing under the Act at this time, please let us know if you are interested in participating in recovery efforts for this species. Additionally, we invite you to submit any new information on this species



whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as an endangered or threatened species and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402.

Section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service.

Federal agency actions within the species' habitat that may require conference or consultation or both as described in the preceding paragraph include management and any other landscape-altering activities on Federal lands administered by the issuance of section 404 Clean Water Act (33 U.S.C. 1251 et seq.) permits by the U.S. Army Corps of Engineers, and construction and maintenance of roads or highways by the Federal Highway Administration.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to threatened wildlife. The prohibitions of section 9(a)(1) of the Act, as applied to threatened wildlife and codified at 50 CFR 17.31, make it illegal for

any person subject to the jurisdiction of the United States to take (which includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these) threatened wildlife within the United States or on the high seas. In addition, it is unlawful to import; export; deliver, receive, carry, transport, or ship in interstate or foreign commerce in the course of commercial activity; or sell or offer for sale in interstate or foreign commerce any listed species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to employees of the Service, the National Marine Fisheries Service, other Federal land management agencies, and State conservation agencies.

We may issue permits to carry out otherwise prohibited activities involving threatened wildlife under certain circumstances. Regulations governing permits are codified at 50 CFR 17.32. With regard to threatened wildlife, a permit may be issued for the following purposes: for scientific purposes, to enhance the propagation or survival of the species, for economic hardship, for zoological exhibition, for educational purposes, or for other special purposes consistent with the purposes of the Act. There are also certain statutory exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

It is our policy, as published in the *Federal Register* on July 1, 1994 (59 FR 34272), to identify to the maximum extent practicable at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of the effect of a proposed listing on proposed and ongoing activities within the range of the species proposed for listing.

Activities that the Service believes could potentially harm the Panama City crayfish and result in “take” include, but are not limited to:

- (1) Unauthorized handling or collecting of the species;
- (2) Destruction or alteration of the species’ habitat by development;
- (3) Actions that would alter the hydrology within suitable soils available for the Panama City crayfish;
- (4) Actions that result in permanent loss of habitat within suitable soils once available to the Panama City crayfish;
- (5) Application of chemicals, including insecticides and petroleum products in violation of label restrictions, or other actions that pollute the soils and waters that are used by the Panama City crayfish; and
- (6) Destruction of herbaceous vegetation directly adjacent to occupied pools that affects the hydrology and removes cover for the crayfish.

Questions regarding whether specific activities would constitute a violation of section 9 of the Act should be directed to the Panama City Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**, above).

### **Required Determinations**

#### *Clarity of the Rule*

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

- (1) Be logically organized;
- (2) Use the active voice to address readers directly;

- (3) Use clear language rather than jargon;
- (4) Be divided into short sections and sentences; and
- (5) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in **ADDRESSES**. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

*National Environmental Policy Act (42 U.S.C. 4321 et seq.)*

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act, need not be prepared in connection with listing a species as an endangered or threatened species under the Endangered Species Act. We published a notice outlining our reasons for this determination in the *Federal Register* on October 25, 1983 (48 FR 49244).

## **References Cited**

A complete list of references cited in the SSA report is available on the Internet at <http://www.regulations.gov> and upon request from the Panama City Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**, above).

## **Authors**

The primary authors of this proposed rule are the staff members of the Service's Unified Listing Team and the Panama City Ecological Services Field Office.

## List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

## Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

### PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

1. The authority citation for part 17 continues to read as follows:

AUTHORITY: 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245, unless otherwise noted.

2. Amend § 17.11(h), the List of Endangered and Threatened Wildlife, by adding an entry for “Crayfish, Panama City” in alphabetical order under CRUSTACEANS to read as set forth below:

#### § 17.11 Endangered and threatened wildlife.

\* \* \* \* \*

(h) \* \* \*

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
* * * * *	* * *			
CRUSTACEANS				
* * * * *	* * *			
Crayfish, Panama City	<i>Procambarus econfinae</i>	Wherever found	T	[ <i>Federal Register</i> citation when published as a final rule]
* * * * *	* * *			

\* \* \* \* \*

Dated: November 21, 2017

Signed: James W. Kurth

*Deputy Director  
for U.S. Fish and Wildlife Service  
Exercising the Authority of the Director  
for U.S. Fish and Wildlife Service*

Billing Code 4333-15

[FR Doc. 2017-28313 Filed: 1/2/2018 8:45 am; Publication Date: 1/3/2018]